Experimental Brain Research

Volume 89 · 1992

Managing Editors P. Andersen, Oslo W.D. Willis, Galveston V.J. Wilson, New York

Board of Editors

Neurophysiology
P. Andersen
Institute of Neurophysiology
University of Oslo
Karl Johansgt. 47
N-0162 Oslo 1
Norway
FAX 2-85 12 49

V.J. Wilson
The Rockefeller University
1230 York Avenue
New York, NY 10021, USA
FAX 212-327-8530

Sensory Physiology
R. Shapley
New York University
Faculty of Arts and Science
Center for Neural Science
4 Washington Place, R. 912
New York, NY 10003, USA

W.D. Willis, jr.
Dept. of Anatomy and Neurosciences
Marine Biomedical Inst.
The University of Texas Medical Branch
200 University Bvd., S. 608
Galveston, TX 77550-2772
USA
FAX 409-762-9382

Neuropharmacology
G.L. Collingridge
University of Birmingham
Dept. of Pharmacology
The Medical School
Edgbaston
Birmingham B15 2TT, U.K.

Neuroanatomy and Developmental Neurobiology
L.J. Garey
Dept. of Anatomy
Charing Cross & Westminster Medical School
Fulham Palace Road
London W6 8RF, U.K.

C. Sotelo
INSERM – U 106 –
Hôpital de la Salpetrière
47 Bd. de l'Hôpital
F-75651 Paris Cedex 13
France

Histochemistry and Neuroplasticity
A. Björklund
Dept. of Histology
University of Lund
Biskopsgatan 5
S-22362 Lund, Sweden

Neuroendocrinology
W. Wuttke
Universitäts-Frauenklinik
Abteilung für klinische und experimentelle Endokrinologie
Robert-Koch-Str. 40
W-3400 Göttingen, FRG

Behavioural Sciences and Neuropsychology
A.D. Milner
Psychological Laboratory
University of St. Andrews
St. Andrews, Fife KY16 9JU
U.K.

Board of Co-Editors

Neurophysiology
A. Berthoz, Paris
V.B. Brooks, London (Ont.)
J. Bureš, Praha
R.E. Burke, Bethesda
P. Buser, Paris
N. Dieringer, München
J.C. Eccles, Contra
E.E. Fetz, Seattle
A.P. Georgopoulos, Baltimore
C. Ghez, New York
J.M. Goldberg, Chicago
U. Heinemann, Köln
H. Hultborn, Copenhagen
M. Ito, Tokyo
P.G. Kostyuk, Kiev
H.D. Lux, München
J. Massion, Marseille
J.C. Rothwell, London
P. Rudomin, México
R.F. Schmidt, Würzburg
R.H. Schor, Pittsburgh
H. Shimazu, Tokyo
J.F. Soechting, Minneapolis
T. Tsumoto, Osaka
M. Wiesendanger, Fribourg

Sensory Physiology
B. Cohen, New York
H. Collewijn, Rotterdam
M. Cynader, Vancouver
U. Eysel, Bochum
B. Fischer, Freiburg i. Br.
M.E. Goldberg, Bethesda
P. Hammond, Keele
K.-P. Hoffmann, Bochum
A. Iggo, Edinburgh
R. Klinke, Frankfurt/M.
L. Maffei, Pisa
P.B.C. Matthews, Oxford
G.A. Orban, Leuven
W. Singer, Frankfurt/M.
N. Suga, St. Louis
S.P. Wise, Poolesville

Neuropharmacology
Y. Ben-Ari, Paris
I. Creese, Newark
D.R. Curtis, Canberra
P. Feltz, Strasbourg
T.P. Hicks, Greensboro
T. Hökfelt, Stockholm
L. Iversen, Hoddesdon
H. McLennan, Vancouver
J.F. Mitchell, Bristol
M. Otsuka, Tokyo
A. Schousboe, Copenhagen
P. Seeman, Toronto
A.M. Sillito, London
W. Zieglgänsberger, München

Neuroanatomy and Developmental Neurobiology
J. Altman, West Lafayette
P. Brodal, Oslo
H. Holländer, München
G.M. Innocenti, Lausanne
E.G. Jones, Irvine
K. Kawamura, Tokyo
G. Rager, Fribourg
E. Rinvik, Oslo
P. Rakic, New Haven
P. Somogyi, Oxford
J. Szentágothai, Budapest
F. Walberg, Oslo
E. Winkelmann, Leipzig

Histochemistry and Neuroplasticity
A.J. Aguayo, Montreal
S.B. Dunnett, Cambridge
L. Olson, Stockholm
J. Storm-Mathisen, Oslo
L.W. Swanson, San Diego

Neuroendocrinology
R. Dyer, Cambridge
W. Lichtensteiger, Zürich
B.S. McEwen, New York
D.W. Pfaff, New York

Behavioural Sciences and Neuropsychology
G. Berlucchi, Verona
A. Cowey, Oxford
J.A. Gray, London
V. Henn, Zürich
S.D. Iversen, Harlow
M. Jeannerod, Lyon
C.A. Marzi, Verona
M. Mishkin, Bethesda
D. Ploog, München
G. Rizzolatti, Parma
E.T. Rolls, Oxford

Springer International

Experimental Brain Research

Founded in 1966. Editorial Board: P. Dell, J.C. Eccles, D.M. MacKay, D. Ploog, J. Szentágothai, H. Waelsch.
Springer, Berlin Heidelberg New York.

Copyright

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.
All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g. as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, expressed or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA

Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of the U.S. Copyright Law, provided a fee is paid. This fee is US $ 0.20 per page per copy, plus a basic fee of US $ 2.00 per article. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0014–4819, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

Offprints may be ordered at cost price when the page proofs are returned.

Printers: Universitätsdruckerei H. Stürtz AG, W-8700 Würzburg
© by Springer-Verlag Berlin Heidelberg 1992
Springer-Verlag GmbH & Co KG W-1000 Berlin 33, FRG

Contents

Aas J-E, Laake JH, Brodal P, Ottersen P: Immunocytochemical evidence for in vitro release of glutamate and GABA from separate nerve terminal populations in the rat pontine nuclei 540
Adler G → Brooks-Eidelberg BA
Aiple F → Weber H
Andriason I → Leveteau J
Angaut P → Cicirata F
Annicchiarico-Petruzzelli M → Savarese A
Aosaki T → Kimura M
Araki M → Nakamura M
Ashby P → Brouwer B

Bäckström L → Johansson RS
Baird MS → Kolasa K
Bairstow BM, Harvey AR: The morphology and connectivity of dissociated and reaggregated fetal tectal tissue transplanted to the midbrain of newborn rats 560
Barlow SM → Farley GR
Bartlett RM → Savelsbergh GJP
Becker W → Mergner T
Behan M, Jourdain A, Bray GM: Calcium binding protein (calbindin D28k) immunoreactivity in the hamster superior colliculus: ultrastructure and lack of co-localization with GABA 115
Beisteiner R → Lang W
Benson PJ → Hietanen JK
Bijlani V → Hayaran A
Bolton PS → Yates BJ
Bon L, Lucchetti C: The dorsomedial frontal cortex of the macaca monkey: fixation and saccade-related activity 571
Bray GM → Behan M
Brodal P → Aas J-E
Brooks-Eidelberg BA, Adler G: A frontal cortical potential associated with saccades in humans 441
Brouwer B, Ashby P: Corticospinal projections to lower limb motoneurons in man 649
Burden AM → Savelsbergh GJP
Burkhalter A → Johnson RR

Champagnat J → Pierrefiche O
Chmelka JV → Farley GR
Cicirata F, Angaut P, Serapide MF, Panto MR, Nicotra G: Multiple representation in the nucleus lateralis of the cerebellum: an electrophysiologic study in the rat 352
Citro G → Savarese A
Colantoni A → Savarese A
Cruse H, Warnecke H: Coordination of the legs of a slow-walking cat 147

Dassonville P, Schlag J, Schlag-Rey M: The frontal eye field provides the goal of saccadic eye movement 300
Dechesne CJ → Desmadryl G
Deecke L → Lang W
Denavit-Saubié M → Pierrefiche O
Desmadryl G, Dechesne CJ: Calretinin immunoreactivity in chinchilla and guinea pig vestibular end organs characterizes the calyx unit subpopulation 105
Dietz V, Gollhofer A, Kleiber M, Trippel M: Regulation of bipedal stance: dependency on "load" receptors 229
Di Loreto S, Florio T, Scarnati E: Evidence that non-NMDA receptors are involved in the excitatory pathway from the pedunculopontine region to nigrostriatal dopaminergic neurons 79
Di Pasquale E, Monteau R, Hilaire G: In vitro study of central respiratory-like activity of the fetal rat 459
Dittrich WH → Hietanen JK
Djamgoz MBA → Yamada M
Donoghue JP, Leibovic S, Sanes JN: Organization of the forelimb area in squirrel monkey cortex: representation of digit, wrist, and elbow muscles 1
Downie JW → Fedirchuk B
Dressnandt J, Jürgens U: Brain stimulation-induced changes of phonation in the squirrel monkey 549
Dunnett SB → Muir JL
Dyon-Laurent C → Sara SJ

Eaton SA → Roberts WA
Everitt BJ → Muir JL

Fadiga L → Fogassi L
Farley GR, Barlow SM, Netsell R, Chmelka JV: Vocalizations in the cat: behavioral methodology and spectrographic analysis 333
Farley GR, Barlow SM, Netsell R: Factors influencing neural activity in parabrachial regions during cat vocalizations 341
Fedirchuk B, Hochman S, Shefchyk SJ: An intracellular study of perineal and hindlimb afferent inputs onto sphincter motoneurons in the decerebrate cat 511
Fedirchuk B, Song L, Downie JW, Shefchyk SJ: Spinal distribution of extracellular field potentials generated by electrical stimulation of pudendal and perineal afferents in the cat 517
Feldman AG → Levin MF
Fischer B, Weber H: Characteristics of "anti" saccades in man 415
Fischer B → Weber H
Fletcher WA → Gellman RS
Florio T → Di Loreto S
Fogassi L, Gallese V, Pellegrino di G, Fadiga L, Gentilucci M, Luppino G, Matelli M, Pedotti A, Rizzolatti G: Space coding by premotor cortex 686
Foutz AS → Pierrefiche O
Fujita SC → Kosaka T

Gallese V → Fogassi L
Gellman RS, Fletcher WA: Eye position signals in human saccadic processing 425
Gentilucci M → Fogassi L
Gibbs CM, Prescott LB, Powell DA: A comparison of multiple-unit activity in the medial prefrontal and agranular insular cortices during Pavlovian heart rate conditioning in rabbits 599
Ginn SR, Powell DA: Nucleus basalis lesions attenuate aquisition, but not retention, of Pavlovian heart rate conditioning and have no effect on eyeblink conditioning 501
Gollhofer A → Dietz V
Gopinath G → Hayaran A
Goto T → Yates BJ
Grant S, Keating MJ: Changing patterns of binocular visual connections in the intertectal system during development of the frog, *Xenopus laevis*. III. Modifications following early eye rotation 383
Greenfield SA → Webb CP
Guerrieri P → Savarese A
Guibert B → Sara SJ
Guillemot J-P → Ptito M
Gusev AG → Voronin LL

Häger C → Johansson RS
Hammond GR → Murphy PR
Harley CW, Sara SJ: Locus coeruleus bursts induced by glutamate trigger delayed perforant path spike amplitude potentiation in the dentate gyrus 581
Harvey AR → Bairstow BM
Hayaran A, Wadhwa S, Gopinath G, Bijlani V: Developing dentate nucleus in man: a qualitative and quantitative study 640
Heizmann CW → Kosaka T
Hensbergen E, Kernell D: Task-related differences in distribution of electromyographic activity within peroneus longus muscle of spontaneously moving cats 682
Hess G → Kuhnt U
Hess G → Voronin LL
Hietanen JK, Perrett DI, Oram MW, Benson PJ, Dittrich WH: The effects of lighting conditions on responses of cells selective for face views in the macaque temporal cortex 157
Hilaire G → Di Pasquale E
Hochman S → Fedirchuk B
Hosoya Y, Yaginuma H, Okado N, Kohno K: Morphology of sympathetic preganglionic neurons innervating the superior cervical ganglion in the chicken: an immunohistochemical study using retrograde labeling of cholera toxin subunit B 478
Hu Y → Kimura M

Isa T, Itouji T: Axonal trajectories of single Forel's field H neurones in the mes-

encephalon, pons and medulla oblongata in the cat 484
Ishida A → Kimura M
Itoh K → Ogawa-Meguro R
Itouji T → Isa T

Johansson RS, Häger C, Bäckström L: Somatosensory control of precision grip during unpredictable pulling loads. III. Impairments during digital anesthesia 204
Johansson RS, Häger C, Riso R: Somatosensory control of precision grip during unpredictable pulling loads. II. Changes in load force rate 192
Johansson RS, Riso R, Häger C, Bäckström L: Somatosensory control of precision grip during unpredictable pulling loads. I. Changes in load force amplitude 181
Johnson GVW → Kolasa K
Johnson RR, Burkhalter A: Evidence for excitatory amino acid neurotransmitters in the geniculo-cortical pathway and local projections within rat primary visual cortex 20
Jope RS → Kolasa K
Jourdain A → Behan M
Jürgens U → Dressnandt J
Jüttner M, Wolf W: Occurrence of human express saccades depends on stimulus uncertainty and stimulus sequence 678

Keating MJ → Grant S
Kemppainen P → Pertovaara A
Kernell D → Hensbergen E
Kim CBY → Moore RJ
Kimmig H → Mergner T
Kimura M, Aosaki T, Hu Y, Ishida A, Watanabe K: Activity of primate putamen neurons is selective to the mode of voluntary movement: visually guided, self-initiated or memory-guided 473
Kleiber M → Dietz V
Knight RA → Savarese A
Kohno K → Hosoya Y
Kolasa K, Jope RS, Baird MS, Johnson GVW: Alterations of choline acetyltransferase, phosphoinositide hydrolysis, and cytoskeletal proteins in rat brain in response to colchicine administration 496
Kosaka T, Heizmann CW, Fujita SC: Monoclonal antibody 473 selectively stains a population of GABAergic neurons containing the calcium-binding protein parvalbumin in the rat cerebral cortex 109
Kuhnt U, Hess G, Voronin LL: Statistical analysis of long-term potentiation of large excitatory postsynaptic potentials recorded in guinea pig hippocampal slices: binomial model 265
Kuhnt U → Voronin LL

Laake JH → Aas J-E
Lachapelle P → Molotchnikoff S
Lamarre Y → Levin MF
Lang W, Beisteiner R, Lindinger G, Deecke L: Changes of cortical activity when executing learned motor sequences 435
Latanov A → Weber H
Lehman SL → Lum PS
Leibovic S → Donoghue JP
Lepore F → Ptito M
Leppänen H → Pertovaara A
Leveteau J, Andriason I, Mac Leod P: The bilateral bulbar projections of the primary olfactory neurons in the frog 93
Leviel V → Sara SJ
Levin MF, Feldman AG, Milner TE, Lamarre Y: Reciprocal and coactivation commands for fast wrist movements 669
Li PY → Lum PS
Lindinger G → Lang W
Lovick TA: Inhibitory modulation of the cardiovascular defence response by the ventrolateral periaqueductal grey matter in rats 133
Low JC → Yamada M
Lucchetti C → Bon L
Lum PS, Reinkensmeyer DJ, Lehman SL, Li PY, Stark LW: Feedforward stabilization in a bimanual unloading task 172
Luppino G → Fogassi L
Lüscher H-R → Streit J

Mac Leod P → Leveteau J
Martinet L, Servière J, Peytevin J: Direct retinal projections of the "non-image forming" system to the hypothalamus, anterodorsal thalamus and basal telencephalon of mink (*Mustela vison*) brain 373
Masuzawa T → Nakamura M
Matelli M → Fogassi L
Matsushita M, Yaginuma H, Tanami T: Somatotopic termination of the spino-olivary fibers in the cat, studied with the wheat germ agglutinin-horseradish peroxidase technique 397
Melino G → Savarese A
Memezawa H, Minamisawa H, Smith M-L, Siesjö BK: Ischemic penumbra in a model of reversible middle cerebral artery occlusion in the rat 67
Mergner T, Rottler G, Kimmig H, Becker W: Role of vestibular and neck inputs for the perception of object motion in space 655
Milner TE → Levin MF
Minamisawa H → Memezawa H
Mizuno N → Ogawa-Meguro R
Molinar-Rode R, Pasik P: Amino acids and N-acetyl-glutamate as neurotransmitter candidates in the monkey retinogeniculate pathways 40
Molotchnikoff S, Morin C, Lachapelle P: Influence of remote targets on directionality of striate neurons in rabbits 531
Monteau R → Di Pasquale E
Moore RJ, Spear PD, Kim CBY, Xue J-T: Binocular processing in the cat's dorsal lateral geniculate nucleus. III. Spatial frequency, orientation, and direction sensitivity of nondominant-eye influences 588
Morin C → Molotchnikoff S
Muir JL, Dunnett SB, Robbins TW, Everitt BJ: Attentional functions of the forebrain cholinergic systems: effects of intraventricular hemicholinium, physostigmine, basal forebrain lesions and intracortical grafts on a multiple-choice serial reaction time task 611
Murphy PR, Hammond GR: Short latency cutaneous reflex responses of γ-efferents in the decerebrate cat 140

Nakamura M, Araki M, Oguro K, Masuzawa T: Differential distribution of 68 Kd and 200 Kd neurofilament proteins in the gerbil hippocampus and their early distributional changes following transient forebrain ischemia 31
Netsell R → Farley GR
Nicotra G → Cicirata F

Ogawa-Meguro R, Itoh K, Mizuno N: Substance P-, vasoactive intestinal polypeptide-, and cholecystokinin-like immunoreactive projections from the superior colliculus to the dorsal lateral geniculate nucleus in the rat 59
Oguro K → Nakamura M
Okado N → Hosoya Y
Oram MW → Hietanen JK
Ottersen OP → Aas J-E

Panto MR → Cicirata F
Pasik P → Molinar-Rode R
Pedotti A → Fogassi L
Pellegrino di G → Fogassi L
Perrett DI → Hietanen JK
Pertovaara A, Kemppainen P, Leppänen H: Lowered cutaneous sensitivity to nonpainful electrical stimulation during isometric exercise in humans 447
Peytevin J → Martinet L
Pierrefiche O, Foutz AS, Champagnat J, Denavit-Saubié M: The bulbar network of respiratory neurons during apneusis induced by a blockade of NMDA receptors 623
Powell DA → Gibbs CM
Powell DA → Ginn SR
Prescott LB → Gibbs CM
Ptito M, Lepore F, Guillemot J-P: Loss of stereopsis following lesions of cortical areas 17–18 in the cat 521
Reinkensmeyer DJ → Lum PS
Riso R → Johansson RS
Rizzolatti G → Fogassi L
Robbins TW → Muir JL
Roberts WA, Eaton SA, Salt TE: Widely distributed GABA-mediated afferent inhibition processes within the ventrobasal thalamus of rat and their possible relevance to pathological pain states and somatotopic plasticity 363
Roschin V → Voronin LL
Rottler G → Mergner T

Sako K → Tsuchiya M
Salt TE → Roberts WA
Sanes JN → Donoghue JP

Sara SJ, Dyon-Laurent C, Guibert B, Leviel V: Noradrenergic hyperactivity after partial fornix section: role in cholinergic dependent memory performance 125
Sara SJ → Harley CW
Savarese A, Annicchiarico-Petruzzelli M, Citro G, Zupi G, Spagnoli LG, Colantoni A, Vernole P, Stephanou A, Knight RA, Guerrieri P, Melino G: Characterisation of a human glioblastoma cell line (LI) expressing hypothalamic and pituitary hormones 408
Savelsbergh GJP, Whiting HTA, Burden AM, Bartlett RM: The role of predictive visual temporal information in the coordination of muscle activity in catching 223
Scarnati E → Di Loreto S
Schlag J → Dassonville P
Schlag-Rey M → Dassonville P
Schwarz U → Waespe W
Serapide MF → Cicirata F
Servière J → Martinet L
Shefchyk SJ → Fedirchuk B
Siesjö BK → Memezawa H
Smith M-L → Memezawa H
Song L → Fedirchuk B
Spagnoli LG → Savarese A
Spear PD → Moore RJ
Stark LW → Lum PS
Stephanou A → Savarese A
Streit J, Lüscher H-R: Miniature excitatory postsynaptic potentials in embryonic motoneurons grown in slice cultures of spinal cord, dorsal root ganglia and skeletal muscle 453

Tanami T → Matsushita M
Trippel M → Dietz V
Tsuchiya M, Sako K, Yura S, Yonemasu Y: Cerebral blood flow and histopathological changes following permanent bilateral carotid artery ligation in Wistar rats 87

Vernole P → Savarese A
Voronin LL, Kuhnt U, Gusev AG: Analysis of fluctuations of "minimal" excitatory postsynaptic potentials during long-term potentiation in guinea pig hippocampal slices 288
Voronin LL, Kuhnt U, Gusev AG, Hess G: Quantal analysis of long-term potentiation of "minimal" excitatory postsynaptic potentials in guinea pig hippocampal slices: binomial approach 275
Voronin LL, Kuhnt U, Hess G, Gusev AG, Roschin V: Quantal parameters of "minimal" excitatory postsynaptic potentials in guinea pig hippocampal slices: binomial approach 248
Voronin LL → Kuhnt U

Wadhwa S → Hayaran A
Waespe W, Schwarz U, Wolfensberger M: Firing characteristics of vestibular nuclei neurons in the alert monkey after bilateral vestibular neurectomy 311
Warnecke H → Cruse H
Watanabe K → Kimura M
Watanabe M: Frontal units of the monkey coding the associative significance of visual and auditory stimuli 233
Webb CP, Greenfield SA: Non-cholinergic effects of acetylcholinesterase in the substantia nigra: a possible role for an ATP-sensitive potassium channel 49
Weber H, Aiple F, Fischer B, Latanov A: Dead zone for express saccades 214
Weber H → Fischer B
Whiting HTA → Savelsbergh GJP
Wolf W → Jüttner M
Wolfensberger M → Waespe W

Xue J-T → Moore RJ

Yaginuma H → Hosoya Y
Yaginuma H → Matsushita M
Yamada M, Low JC, Djamgoz MBA: Chromaticity of synaptic inputs to H1 horizontal cells in carp retina: analysis by voltage-clamp and spectral adaptation 465
Yates BJ, Goto T, Bolton PS: Responses of neurons in the caudal medullary raphe nuclei of the cat to stimulation of the vestibular nerve 323
Yonemasu Y → Tsuchiya M
Yura S → Tsuchiya M

Zupi G → Savarese A